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SCHOOL OF FORESTRY  
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A Survey of Forestry Education  
in the United States

by

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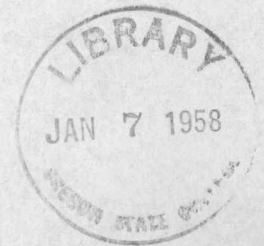
A Thesis

Presented to the Faculty

of the

School of Forestry

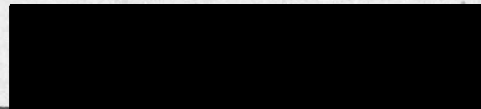
Oregon State College



In Partial Fulfillment  
of the Requirements for the Degree of  
Bachelor of Science

March 14, 1938

Approved:



Professor of Forestry

## C O N T E N T S

	PAGE
Introduction-----	1.
Purpose of report-----	1.
Education in general-----	1.
History of forestry education-----	2.
Forest Schools:	
Numbers-----	3.
Library facilities-----	5.
Faculties-----	8.
Experimental forest areas-----	13.
Summer camps-----	15.
Changes and additions-----	16.
New schools-----	17.
Students enrolled in forestry-----	18.
Selection of a forestry school-----	20.
Entrance requirements-----	22.
School expenses-----	23.
Civil Service opportunities-----	25.
Undergraduate enrollment-----	28.
Graduate enrollment-----	30.
Sizes of graduating classes-----	33.
Graduate employment-----	35.
Conclusions-----	36.
Future employment outlook-----	36.
Future education in forestry schools-----	40.

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### Diagrams

Establishment of Forestry Schools-----	3a.
Student School Expenses-----	23a.
Undergraduate Enrollment-----	29a.
Sizes of Graduating Classes-----	34a.
Forestry Graduate Employment in Per Cent-----	35a.
Sample Questionnaire Sheet-----	43a.

## Appendix

	Page
Professional forest schools in the U.S.-----	44.
Library facilities-----	45..
Experimental forest areas-----	47.
Summer training camps-----	52.
Student expenses-----	54.
Entrance requirements-----	55.
Junior Forester examination-----	59.
Forestry school faculties-----	60.
Graduating classes 1928-1937 inclusive-----	61.
Forestry graduate employment-----	64.
<u>Bibliography</u> -----	66.



## A Survey of Forestry Education in the United States

### INTRODUCTION

#### Purpose of report:

This thesis has been prepared to present a survey of forestry education, past and present, in the United States in brief fashion and to assemble a body of general information about the forestry schools of the United States in the hope that it might be of aid to students investigating the forestry education system of the country. An attempt has also been made to discuss the question of future employment possibilities in forestry work, based largely upon the consideration of alumni employment records of all forestry schools.

#### Education in general:

Before entering into a discussion of the merits of forestry schools now existent in our country it might be wise to review briefly the history of education in America since early colonial days. The twentieth century has ushered in a multitude of changes affecting the life of the average American citizen, and of these changes those effected in all phases of education have been particularly widespread. During the days of expansion, when western frontiers continually beckoned, education was confined to the colonial states along the Atlantic seaboard. Although colleges and universities were gradually established in the prairie states throughout the nineteenth century, the



important centers of education remained concentrated in the east. Those individuals fortunate enough to provide themselves with an advanced education were ordinarily people of the well-to-do class.

Education today presents an entirely different picture. Many states, even the least-populated ones, harbor several institutions of higher learning, and some of these colleges and universities have risen to unprecedented heights in enrollment. Several institutions throughout the country have enrollments above ten thousand; recently the body of students in Columbia University advanced to a point slightly in excess of thirty thousand.

#### Forestry education:

For nearly three hundred years America was lacking in forestry education. Near the close of the nineteenth century, however, "provisions were made for the introduction of technical instruction in forestry into the curricula of several of the larger universities." (1) In 1882, Professor Spaulding of the University of Michigan "inaugurated a series of forestry lectures which dealt in broad terms with forest products, early laws and customs, the necessity of suitable forest legislation and the influence of forests on human affairs." (1) These talks were a means of promoting intelligence on the subject of forestry and were instrumental in "fostering cooperation between the University and the State on the problems of forestry." (2)

Isolated courses had been given in several other colleges prior to nineteen hundred, but they "failed to touch

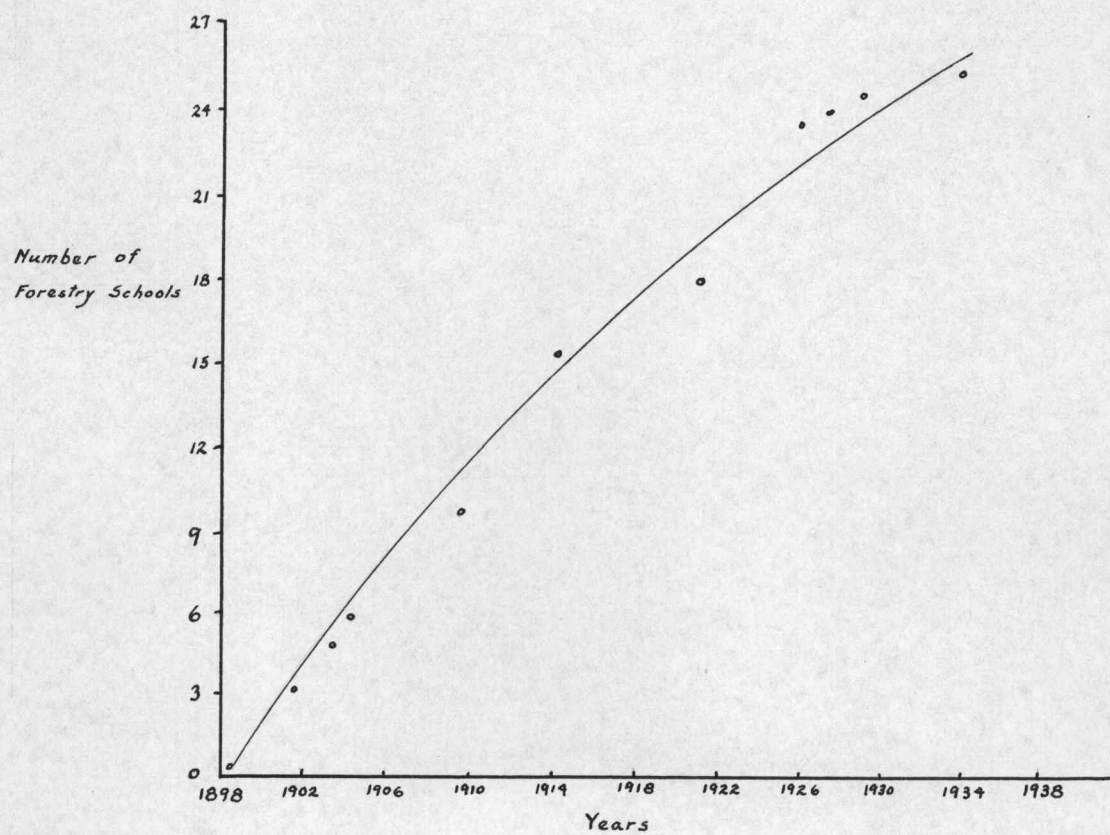
the vital economic problems of forests and their protection, management and perpetuation by natural means."(3) However, evidence at least points to the fact that some elements of forestry were being given at this early date; Illick states that "at least 22 land grant colleges gave some instruction in forestry prior to 1897."(4) Although they had a difficult time to convince the American people that trained foresters were needed, early educators(most of whom had been educated in Europe) such as Fernow, Pinchot, Roth, Graves, Price and Schenck witnessed a steady improvement in forestry education after the close of the century. In 1898 the initial step was taken in establishing a system of professional forestry schools, for in that year Cornell University in New York launched a four year professional course in forestry.(5) Since that time the country has witnessed a rapid growth in the number of forestry schools.

#### FOREST SCHOOLS:

##### Numbers:

Shortly after the close of the century, under the aggressive leadership of President Roosevelt and Gifford Pinchot the federal government launched itself into the business of managing government-owned forestry lands. It was at this time that the administration of federal forests was shifted from the Department of Interior to the Department of Agriculture, and the change resulted almost immediately in improved forest management. Although compelled to administer sixty-three million acres of forest land with a force of eight hundred and twenty-one men, Pinchot rapidly improved condit-

## *Establishment of Forestry Schools*





ions, and undoubtedly the change served to hasten the establishment of several forestry schools which were soon to appear.(6),(1)

Three schools of forestry were established between 1898 and 1900, while the Roosevelt period witnessed the establishment of fifteen more by the year 1910; eight more were added during the decade 1911-1920 and since that time an additional nine were established.(4)

At the present time twenty-four different institutions offer training in forestry leading to a degree(three give professional instruction at a graduate level only), and these schools are now graduating more than 800 trained men each year.(1) Enrollment in forestry schools reached an all time high in 1937 with a total number of 6,067; however, this year's freshman class showed a slight decline and indications point to a gradual decline in the number of graduates in the next few years.(7) Forestry training has grown from a not-too-distant day of impotency to a position which has prompted some men to advocate that measures be taken to curtail either the number of forestry schools in the country or the number of students enrolled in these schools.

And so, having thus briefly surveyed the history of our forestry schools, let us move on to a consideration of the individual schools with particular reference to their faculties and facilities. It is very difficult to attempt to judge the qualifications of the twenty-four schools, since the prevalent conditions vary so much in different institu-

tions. Newer and smaller schools, if judged on their equipment and facilities alone, would necessarily receive a poor rating. If, however, the basis of comparison were to be on the records made by graduates following their emergence from college, the results would present an entirely different picture.

Therefore, no attempt will be made here to rate schools on the basis of either of the two above comparisons; rather these questions will be discussed and an attempt will be made to present advantages and disadvantages of the contrasting elements found in the schools. Much of the information presented was secured by questionnaire and the remainder through a perusal of pamphlets, bulletins and articles pertaining to forestry schools and forestry education.

#### Library facilities:

To function satisfactorily the forestry school should be amply supplied with all essential reading matter; at present, all possible extremes varying from the inadequate to the superfluous exist in the various school library facilities extended to the student. Naturally such richly endowed schools as Yale, Harvard and Duke Universities excel greatly in quantity of forestry reading matter available. Since these schools (with the exception of Duke University) offer only graduate work requiring more research and wider reading, it is perhaps fitting that the schools should possess such complete forest libraries. (8) Yale, with a present endowment of "more than \$1,750,000", possesses a large for-



estry library containing forty-five thousand volumes written in English and foreign languages. In addition the school receives more than "two hundred periodicals and other serial publications of importance in forestry." (9) Likewise, Harvard possesses a library of some 30,000 volumes and Duke also has a fairly complete and growing library. Offering sharp contrast to these extensive facilities are those maintained by many of the smaller colleges; some schools reported approximately 1500 to 2000 books as their total library resources with fifteen or less periodicals on their subscription list. (10)

The character of the school is reflected to some extent by the nature and size of its library facilities. Wealthy institutions, training men in graduate research work, as typified by Yale, Harvard, Duke and possibly Michigan and California, appropriately enough have the ~~the~~ large libraries and train a different type of student than do the smaller and less wealthy colleges in other parts of the country. Here the graduate student is thrown much upon his own resources; he is constantly engaged in individual study and spends much of his time browsing in the library in search of knowledge. He is an older person, more mature in taste and judgement; and the very fact that he is engaged in graduate work would indicate that he is a person of more than average ability--one able to choose meaty articles of value to him from the vast collection of information available.

On the other hand, smaller colleges, concerned primarily with the problems of the undergraduate, have no need for



such voluminous facilities. During his first two years in college the student is ordinarily altogether too busy studying either the fundamentals of forestry or courses in fields apart from forestry to find the time, or the need, for reference to books other than just his textbooks. He is usually lacking in foresight and purpose so that the reading of technical forestry articles, outside of the few he might be compelled to read in his courses, is merely drudgery to him which he fortunately does not have to undergo at the present time. Advancing to the position of a junior or senior usually serves to stimulate the student's interest in such widely read publications as the Journal of Forestry and American Forests; and during his senior year, particularly, the student follows these periodicals fairly closely, not because he has to but because it is there that his interests lie.

However, it is only on rare occasions that the student seeks out books on forestry in the library of his own initiative, since many of them are highly technical in content; many are quite old publications; and, finally, the student finds it difficult to spare the time for such pursuits. The severity of the forestry curricula limits the spare time of the student and he finds it more profitable to read of the more modern phases of forestry in the Journal of Forestry or some other current magazine.

Unless under the efficient administration of a librarian, and unless the books are so arranged that the more important volumes may be found readily, the large library handicaps the student in that he spends a considerable portion of his time

looking for the material he desires. He may have to thumb through several books pertaining to his subject before he finally strikes upon the one which serves his purpose best. In all probability the smaller library would contain this stellar book in its field together with possibly a few others, and the searcher would have little trouble finding the book he wanted under such an arrangement. There is, moreover, little need for numerous volumes written in foreign languages at the undergraduate schools. Exceptional, indeed, is the student who has a good reading knowledge of French or German; and, even should he be so talented, there would be no call for him to read extensively in such literature.

Such reading is of some importance to the research forester but in many cases is inconsequential even to him. Professor P.A. Herbert, speaking before a committee on forestry degrees, recently said: "I challenge the need of foreign languages to be cultured in every case. I maintain you can do the work of doctorate without having any foreign language whatsoever."(1) Dr. J.A. Larsen, attending the same conference, went on to say that "the foreign language requirement of the master's and doctor's degree is largely a joke."(1) Nevertheless, complete libraries are an integral part of any good forest school, and those institutions equipped with inadequate library facilities should endeavor to build them up to a satisfactory point.

#### Faculties:

But now let us move from a consideration of library facilities to a question of even greater importance--that of forestry school faculties. More than any other one thing the



caliber of teacher in a school serves to make or break the reputation and efficacy of the school. Fortunate, indeed, is the school who has a staff of able teachers, who are genuinely interested in the welfare of the student. As Spaulding remarks, the student "can learn mensuration and silviculture from the textbook, but he cannot learn vision and imagination, except as it is taught him by the real teacher."(1)

As might be expected the ratio of student to teacher has increased to an appreciable extent, since the beginning of the Roosevelt administration. Professors in many schools have been given additional duties--they are worked hard and have little opportunity for personal reading or research in forestry. It would almost seem that, burdened as he is, the professor cannot train his charges as efficiently as he formerly did in smaller classes. He has lost the personal touch with his students; and little can be done about it, since it is well-nigh impossible to come to know fifty or sixty students intimately.

However, as yet it has not been definitely proven that the teacher is less effective when teaching large groups, although the supposition does seem probable.(11) Graves, in discussing this question, says that he would "be interested to know whether the increase in size of classes has impaired to a noticeable degree the effectiveness of teaching."(1)

Not so long ago when five or ten students comprised the average class, it was a simple matter for the instructor to deal with them individually. He was not hampered by limited time, and encouraged sessions of discussion after class. But



now with classes ranging in size from twenty up to as many as seventy students, the professor has more than enough to keep him busy without being bothered by each student's individual cares and troubles. As a result of figures turned in on the questionnaire, it was found that the average class for all schools was comprised of a little more than twenty-six students but that the average size of classes varied from a low of nine at Colorado to a high of seventy-one at Purdue University.(12) Graduate schools, that is Yale and Harvard, have maintained a low ratio of student to professor, rightfully enough. For example, at Yale University ten competent instructors concentrate their efforts on forty-nine students, although it is true that here much of the student's time is spent in individual research with only occasional assistance from the instructor.(9)

It was found in a survey of forestry school faculties that their average age did not vary greatly, and almost without exception they might be classed as middle-aged. The average for most schools was found to be in the late thirties or early forties, the Colorado faculty averaging the oldest with an age of forty-five and the University of Florida the youngest with an average age of but thirty years.(13) An average faculty age lying between thirty-five and forty is desirable for two reasons. If the faculty ages of a school averaged fifty or over, this would mean that several professors would be in their sixties or possibly even older. Although it does not necessarily follow that an older man makes a poorer

teacher, yet at times they lack forcefulness and are hindered by their age in the field.

On the other hand when the average faculty age totals only thirty years, difficulties might very well arise unless the men are exceptionally shrewd and experienced for their age. Any instructor whose age is under thirty, if he has occasion to teach upperclassmen, may often find himself in hot water because some of his students will be older than he is--men often with years of experience in the field. These older students with a mature outlook on life do not always find educational methods to their liking, and do not believe everything they see in print. Consequently, unless the instructor has a good personality, is shrewd and well-informed on his subject, he stands an excellent chance of losing the respect of the class. Although it doubtless is not always the case, there is a definite correlation between the age of the faculty and their efficacy in teaching.

In considering forest school faculties the discussion is hardly complete unless one examines the institution from which the teacher has been graduated--that is, are they a product of the school in which they are teaching or have they been educated on some other campus? Oddly enough, the figures received indicate that in nearly all schools most of the faculty graduated from some other institutions. This is easily explained in the case of West Virginia, Louisiana, Florida and Purdue, since these schools have not been functioning long enough to draw upon their own graduates for teaching duties.



Older schools such as the University of Michigan, Oregon State College and the University of Maine show a larger percentage of alumni on their teaching staffs. Of the three above-mentioned schools Oregon State has the largest percentage of alumni on its staff, followed by the University of Maine with 65% and the University of Michigan with 36%. As the years go by the newer schools will call upon their own alumni to return and take up teaching work, but for some of the newest forest schools this time is still several years hence.

Staffs composed largely of former graduates have their advantages and also their disadvantages. Basic courses such as mensuration and forest engineering can be taught more efficiently by a former graduate, since he is familiar with the local conditions that will be encountered and he will know the points to stress and those not to stress.(11) It would preclude any such possibility as, for example, an easterner being employed to teach mensuration at Oregon State College without previous experience in the region. Unfamiliar with scaling and cruising problems here in the west and trained under a system differing considerably from that existant at Oregon State, even though he were a very keen man, he would be unable to teach the course as efficiently as an Oregon State graduate of no more than average ability.

In the case of silviculture, dendrology or possibly forest management, however, the argument shifts; for here experience, travel and first-hand knowledge in the possession of the professor make the course more interesting and valuable to the student. Points of discussion are more vital if the



teacher is able to call upon personal experience to furnish him definite examples. In silviculture the student reads of model white pine forests in the east, of the pernicious chestnut blight which has doomed the eastern chestnut forests, of naval stores operations--of a hundred and one different things. If, after having read about such things, he is able to clear up any points and have others elaborated upon by a professor who has actually witnessed the things he has read about, then he will find the course more enjoyable and will also have a broader and truer conception of that phase of forestry.

Experimental forest areas:

Just as the student may obtain vastly more from written material with a capable professor to guide him--so may he receive similar benefits through field work in the school forest area. Of prime importance to the forestry school is such an area of land that may be used for instruction and experimental purposes, since theories are not worth much as such unless they are tried in the field. To be of greatest value to the students the area should be near the school so that it is possible for them to attend classes here during the week. In the case of Oregon State College the school is fortunate in having an excellent site located less than ten miles away, and it is therefore possible to schedule outdoor classes here for the student one or more times a week. Some schools are not so fortunate in that their forests lie some distance away from the campus, and they are compelled to concentrate their field work in more sporadic but longer visits to their forest areas. This is true of the University of

Minnesota where the nearest accessible forest area lies sixty miles away from the campus.

The acreage owned or managed by all forest schools in the country is amply large to permit the conduction of any needed experiments, although the stocking on some areas is perhaps not all that it might be. Some of the schools are fortunate in having a forest which has been under their control for a good many years; and which, therefore, contains a desirable condition of stocking and a wise selection of species, as well as a number of worth-while experimental projects which are beginning to be of practical benefit. Such an area is well exemplified by the Harvard Forest at Petersham, Massachusetts, which was established in 1907 and managed by R.T. Fisher until his death in 1934. Until recent years the Forest has shown a profit on its operations and has set up as a goal "the production of high-grade timber" but at the same time never have attempts been made to "work counter to nature, but rather to harmonize man's efforts with natural tendencies."(14)

Much of the success of the school forest hinges on the men(or man) in charge. The proper development of such a place requires that the director give unstintingly of his time and effort; successful management of an area does not mean that one can sit back and just watch things grow. If at all practical--that is if permitted by size of area and accessibility--the management of school forests should work toward a self-sustaining basis. To do this many problems,



varying with each school, will have to be overcome; undesirable species will have to be removed, rapid increment encouraged, proper stocking attained, road systems established, silvicultural operations practiced--these are some of the obstacles to be overcome and they will require planning, attention, foresight and interest on the part of those managing the area.(14) Proper supervision cannot be exercised if the man in charge of the experimental forest has also to carry a full teaching load.

Summer camp:

With but very few exceptions the forestry schools of the country require that their students spend a session lasting from eight to twelve weeks in summer camp studying and applying practical forestry. The University of Maine forestry school requires her students to spend six weeks in summer camp during their sophomore year followed by "eight weeks in from the middle of November to the middle of January in permanent camps on a 17,000 acre tract owned by the state" during their senior year.(15) Although western schools require this training almost as universally as those of the east do, the need is not so great because in many cases the student has an opportunity to find employment in the woods during the summer months, which enables him to gain just as much profitable experience as any he might gain through a summer spent in camp.

The above practice is a sound one, desirable in the west as well as in the east, and is particularly helpful to the eastern student who has small opportunity for getting a summer's work in the woods. If this were not a mandatory policy,



students might find themselves, ironically enough, the proud possessors of a degree in forestry and yet unable to apply their knowledge in the field in creditable fashion. Such a carefree experience is a good thing for the students not only from the standpoint of practical knowledge gained but also in that it tends to produce a spirit of camaraderie among them and forms a more closely knit group. The only objection that might be raised against such requirements would be that of the cost to the poor student--unfortunate in his case but still a necessity.

Changes and additions within schools:

In compliance to recent developments in forestry education, it is interesting to note the actions of certain schools as to the changing of present policies. Noteworthy among these changes is the action of Cornell University in its decision to discontinue the instruction given in professional forestry. The "last undergraduate degrees in forestry were conferred in June and September 1936, with one (a man who had been ill) in December of 1937." (5) The final M.F. degrees were conferred in September of 1937. Under the arrangement, as can be seen, the teaching of forestry in New York has been radically changed.

All instruction in profession forestry, both graduate and undergraduate, offered under state auspices is to be concentrated in the New York State College of Forestry at Syracuse, and similarly all professional instruction in wild life conservation and management in the New York State College of Agriculture at Cornell. A few courses in forestry of general,

non-technical nature such as woodlot management will be continued, but Syracuse will assume all cares and responsibilities connected with the task of training professional foresters (under the friendly gaze of the Society of American Foresters which has advocated the consolidation of forestry schools in single states as a desirable step).

Of interest also is the conversion of the Colorado School of Forestry to a Department of Field and Forest Science. In Colorado, as was the case in New York, there existed until recently two forest schools--one at Colorado Springs and the other at Fort Collins. Under the new system the Colorado Springs school has been changed to a "Department of Field and Forest Science where the emphasis is to be on the recreational rather than the commercial aspects of forestry." (16) Thus, a stronger and more centralized system of professional forestry education in one case and a new field of forest recreation training in the other has been made available.

#### New schools:

During the past six years three new forest schools have added their names to the United States roster. Oldest of the three is that established at richly-endowed Duke University in 1932. With ample facilities and a competent staff of instructors Duke has become firmly established in its few short years of existence. Next to be founded was that located in West Virginia University during the fall of 1935. Through the strong and generous assistance of the state, the new school has been able to expand as rapidly as the need arises without being retarded through lack of funds. (11) Although the

first class of the school does not graduate until 1939, the students have already developed into a strong unit. Their forestry club is unusually active; social functions are well attended; a yearbook is being published; and prominent foresters of the state are already showing an interest in the school.

Newest of the forest schools in the United States is that harbored on the campus of the University of Florida. Founded in the fall of 1937, the recent addition is an outgrowth of the old department of forestry in the agriculture college. Dr. E.A. Ziegler, "former director of the Pennsylvania Forest Research Institution and for twenty years director of the Mont Alto School of Forestry, recently with the Southern Forest Experiment Station", has been added to the staff during the past year. Such changes and additions should be carefully considered by the student endeavoring to select a suitable forestry school.

#### Students enrolled in forestry:

It is obvious that the youth of America has come to feel the need for advanced learning; they realize that such education is essential to their future well-being. The perplexing problem to them is the selection of a course which will train them to lead a contented life with a comfortable sustenance. Of late years (particularly since the inauguration of the CCC program) not a few of these many thousands of students throughout the United States have decided to cast their lot with the forestry profession.



Undoubtedly many of these young men weighed the situation carefully before electing to study forestry. They made inquiries as to the qualifications and life of a forester and analyzed themselves in an attempt to determine whether they were fitted for the work. More recently, however, many of the entering freshmen have not been so critical in their self-analysis and have not bothered to acquaint themselves with the physical, ethical and intellectual attainments demanded of the capable forester of today.

As a consequence, forestry schools of the country are training many men who are not qualified for the work--men who would not be truly happy and satisfied in the forestry profession. An important contributing factor to this state of affairs has been the prevalence of jobs available to the forestry graduate since the advent of the CCC program in 1933. Unfortunately, forestry schools have gained in enrollment all out of proportion to the capacity of the field, and in all probability it will be these misfits who will experience the most difficulty in obtaining work.(4)

Thus, it would be a very desirable accomplishment if all freshmen planning to study forestry could be made to realize that it is of the utmost importance to them to think the situation over carefully before entering the forestry profession. They should make an effort to talk over their problem with an older Forest Service officer; many books and magazines on forestry would also help to give them an insight into the question. Above all, they should come to rea-

lize that forestry work requires men of physical strength, who can spend forty hours of heart-breaking effort on the fire line and still come back smiling; men of courage, who can attack a problem with determination and resourcefulness; men of high ideals, who have a clean mind and are loyal to their employers--men who will not grumble when they are forced to devote ten, twelve or more hours a day to their job.(17)

#### Selection of a forestry school:

If, after considering all these things, the young man still aspires toward a forestry career, his next consideration will be that of choosing the school he will attend. In many cases his financial status will make it mandatory that he attend the nearest forestry school to his home. However, in the event that the student does not have to worry particularly about finances or in case his home state does not have a forestry school, he will be in a position to choose the most suitable of several forestry schools.

In making his choice the student should take a number of things into consideration. In the first place he should endeavor to find out what the general reputation of each school is; some have been more progressive and better-administered than others. He should investigate the alumni lists of forestry schools as to their employment-after-graduation record in order to gage his own possible future success. No thinking student, likewise, will neglect to investigate the facilities extended by each school such as the teaching staff, experimental forest areas, library content, working equipment, etc.



He should, furthermore, attempt to discover the objectives and philosophies of teaching followed by these schools--will he be broadly trained, will general knowledge be stressed or will most of his courses be strictly factual in nature? Should he be thoroughly trained forestry alone, or should he attempt to acquire a reasonably broad education, and which school will best enable him to carry out these desires? In this connection Graves wonders whether "efforts to train boys for specific jobs result in superficiality of knowledge and of habits of thought and action", and seems to indicate that he believes this to be the case.(1) He goes on further to say that "in an effort to spread over all phases of applied forestry there may be a tendency to slight some of the most important fundamentals of education" such as the art of independent reading and of interpretation and use of knowledge. These points are all of importance, as the first-year student will come to realize more clearly by the time he is a senior.

Finally, in surveying forestry schools the student should be concerned particularly with the different phases of forestry education extended by the schools. Several alternatives are open to the entering student; he might choose to specialize in Wood Products, Utilization, Lumbering or Technical Forestry and the choice of his field of study should largely influence his choice of a school for most schools are prone to develop thoroughly only one or two of the above-mentioned fields of study. From the above discussion it can be seen that the thinking person will not leap into a course in forestry without giving the matter due consideration and that



he will weigh the merits of forestry schools throughout the country before deciding which school is to be his Alma Mater.

Entrance requirements:

With the heavy influx of students that have moved into the forestry schools, several institutions have been either compelled to or have chosen to limit their body of students through rigid entrance requirements and enrollment limitation; these limitations must, of course, be examined by the person intending to enroll.

For the most part undergraduate schools merely require that the applicant be a graduate of a standard four-year high school in order to be eligible for entrance in their school of forestry. A few schools, who receive more applications than they are able to care for such as Iowa and Syracuse, have limited their enrollment through force of necessity. Others, such as Montana State University and Connecticut State College, have set up restrictions with the intention of building up the quality of their forestry students scholastically. The School of Forestry at Montana State University has embarked upon a rigid program of limited enrollment, whereby students from out of the state must rank in the top half of their high school class before their application for admittance will be considered. Transfer students from other colleges must have a better-than-average standing in their work; and all students must "maintain their work at a satisfactory level", or "they are dropped for a year and not readmitted until they can raise their academic record to that which the school of forestry establishes as an essential

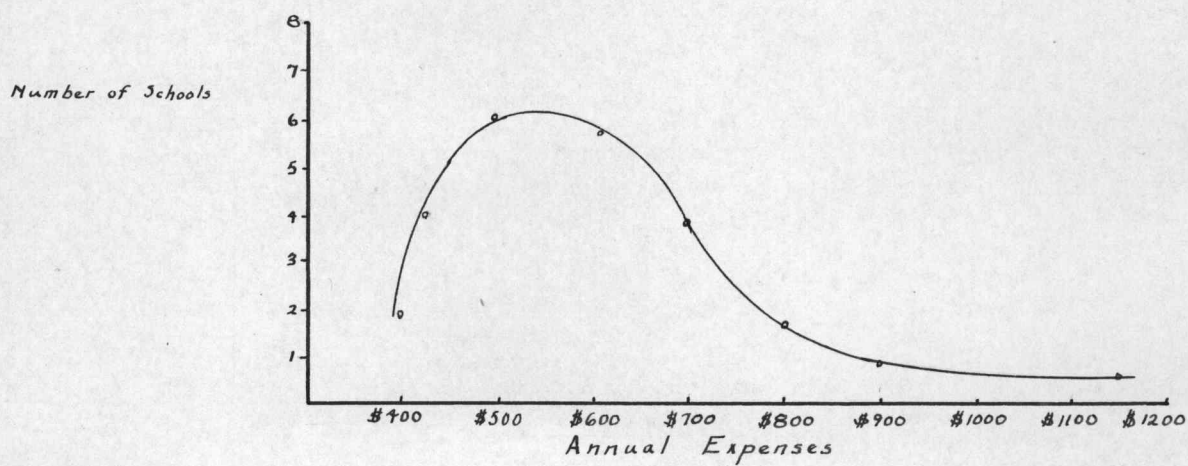
minimum."(18) It might be interesting to note in passing, however, that the mortality of the Montana freshman class has in the past years been no heavier than that of the average school(about 50%). Connecticut requires the student to be a high school graduate and he must rank in the top  $\frac{1}{4}$  of his class, although it was not revealed just how closely the school adhered to this ruling.(19)

California and Michigan list no freshmen or sophomores, although the junior and senior classes are later formed by these two classes.(20) Louisiana State University employs a similar system except that students enter the school of forestry as sophomores in place of juniors. It will be interesting to observe future policies of the United States forest schools pertaining to the admission of students. Some have already indicated by their actions that they favor limited enrollment, and would permit only the better students to attend their school. Other schools, typified by Oregon State College, believe that every student desiring a college education should be permitted to follow his heart's desire, whether it be Forestry or Industrial Arts.(11) Possibly future employment conditions in forestry work will automatically solve the problems of heavy enrollment.

#### School expenses:

The question of expenses, which bothers so many students regardless of what school they may be in, varies considerably among the various schools, and this too will have much to do with the final selection of a school. Obtaining an advanced degree at some of the eastern graduate schools entails the expenditure of quite a sum of money--more than the average

### *Student School Expenses \**



*\*See Appendix for information on individual schools*



student with a pocketbook made gaunt by four years of college is willing to pay. For example, it requires on the average of from \$1100 to \$1200 to complete just one year at Harvard University.(21) However, the average cost of a year in college in the majority of eastern institutions averages in the neighborhood of \$600 with an additional amount of approximately \$100 if the student is from another state.(10) Probably the most reasonable of all eastern forestry schools is that at the University of Florida, where the costs to state residents range from a minimum of \$344.60 to a maximum of \$445.00 for the year.(22)

Many of the schools have jobs available to students, and in this way it is possible for them to cut down expenditures. Government help, particularly, has aided the needy student, and has in many cases made it possible for outstanding students to attend college. The majority of the money spent by the student goes to pay for his room and board; but books, tuition and course fees often contribute a great deal to the total expenditures. Summer camps, likewise, constitute a major expense, since room and board as well as fees must be paid. These charges vary from approximately \$60 to \$100 for a camp lasting six to eight months.

Summer employment, obtained chiefly by students in the western forest schools, often enables the man to earn most, if not all, his coming school year expenses. Judging from recent enrollments, school costs are not prohibitive to the person with ambition and the will to work.

Junior Forester civil service examination:

Still a further consideration which might influence the choice of forestry schools is the fitness of the school with regard to preparation of the student for government work. Just as has been the case with European countries, the United States government has assumed the leadership in forestry work. To administer the 172,000,000 acres now contained within the national forests of the country it has been necessary to employ hundreds of college-trained men, and these men have been chosen on a competitive basis by means of civil service examination. This Junior Forester examination, as it is called, is given by the government whenever men are needed, and anyone may take it, providing that he has acquired a college degree.

The majority of professional foresters emerging from school each year would like very much to pass the examination successfully, and all but a very few take the test. As has been stated previously, some 1034 graduates took the examination last spring and of this number about three hundred passed.(23) Some schools, such as Oregon State College and the University of Idaho, have been very successful in training their graduates to pass the test. On the other hand, graduates of many eastern schools have not been so fortunate, often failing in toto to compete successfully.

This state of affairs has resulted in numerous comments and some criticism on the part of educators in the east, who maintain that it is not a suitable system of education which



strives chiefly to prepare the student for the Junior Forester examination. They insist that the Forest Service is prone to dictate the policies of the schools, and feel that some schools have catered to the demands of the Service too much.(23) However, viewing the question from a more practical standpoint, such definite preparation of students for the civil service examination has its good points. Schools of the far west are situated in regions comprising the bulk of the nation's National Forests; there is no other field of employment so large or promising as the Forest Service in much of this region, and students are admittedly training themselves for government employment, because it extends them the greatest opportunities.

Conditions back east are diametrically opposed to those existent in the west; most of the timber is privately-owned, and better markets together with closer utilization encourage one to train for utilization, selling, woodlot management or some other calling associated with forestry. A proportionately smaller number of Forest Service jobs in the eastern states tends to diminish the importance of federal government work in the forestry schools.

Although little information relative to passage of the Junior Forester examination is available which would indicate the different forestry school's success, the data at hand is interesting. During the spring of 1936, fourteen of the twenty-three Idaho men who took the examination succeeded in passing it, while in 1937 thirty(all those taking the test)



passed it. Louisiana State did not fare so well. In the 1936 tests only one out of three passed. The University of Maine, which trains its men primarily for private and state work in the New England States, has a better record. In 1936 only three out of eleven passed, but in 1937 eleven of the seventeen competing managed to pass.

Tiny New Hampshire College with a total enrollment of eighty foresters graduated four men in the spring of 1936 who were able to pass the test. A total of ten took the examination. In 1936, twenty students from North Carolina State College are reported as having taken the test and of this number only two managed to pass.(15) Standing out in contrast to this poor showing is the success enjoyed by Michigan State students twenty-one out of twenty-eight of whom passed the 1937 examination.

More complete records are available for Oregon State College; her forest school has established an enviable record. Each year Oregon State men taking the test have done uniformly well--better by far than students from most other schools, as these figures should indicate:

<u>Year</u>	<u>No. taking exam</u>	<u>No. passing exam</u>
1929	12	11
1930	19	12
1931	7	5
1932	39	33
1935	--	32
1936	19	13
1937	43	40

However, it is all well and good to talk about the success of past graduates, but the scene confronting the

graduating senior in 1938 promises to be radically different. To the student who has been preparing himself for government work this change will work a hardship; "if the student has directed his efforts too exclusively to problems of public service, he may find himself unprepared in some of the basic requirements for private problems."(1) Graves, speaking of the employment prospect in forestry civil service work for new men, says that "cessation of continued expansion, even without actual reduction of current appropriations, gives little opportunity to employ new men in the public organizations. This may be anticipated in the present situation. The forest schools will be affected because, with the great inflow of students, there is likely to accumulate very quickly a large number of graduates unable to obtain employment."(1)

#### Undergraduate enrollment:

Apparently entrance requirements, expenses and the uncertainty of future employment have not dampened the spirits of those young men who have their hearts set on forestry as a life work. The extremely rapid rise in enrollment experienced since the fall of 1934 has resulted, however, in much detailed study and considerable comment pertaining to forestry education. To begin with, it is a thing which vitally concerns the students themselves, since heavy enrollments materially effect their future employment prospects. Furthermore, the schools have become taxed beyond their facilities, and have been forced either to undergo changes or limit enrollment. Iowa State College has been compelled to limit the number of students in the sophomore class to seventy-five.

Selection of these men is based on individual merit of the applicants, while natives of the state are given prefer-



ance. Syracuse University turns away hundreds of applicants annually, and has also instituted a quota system of points whereby any student failing to complete a certain number of points each semester is automatically dropped. (24)

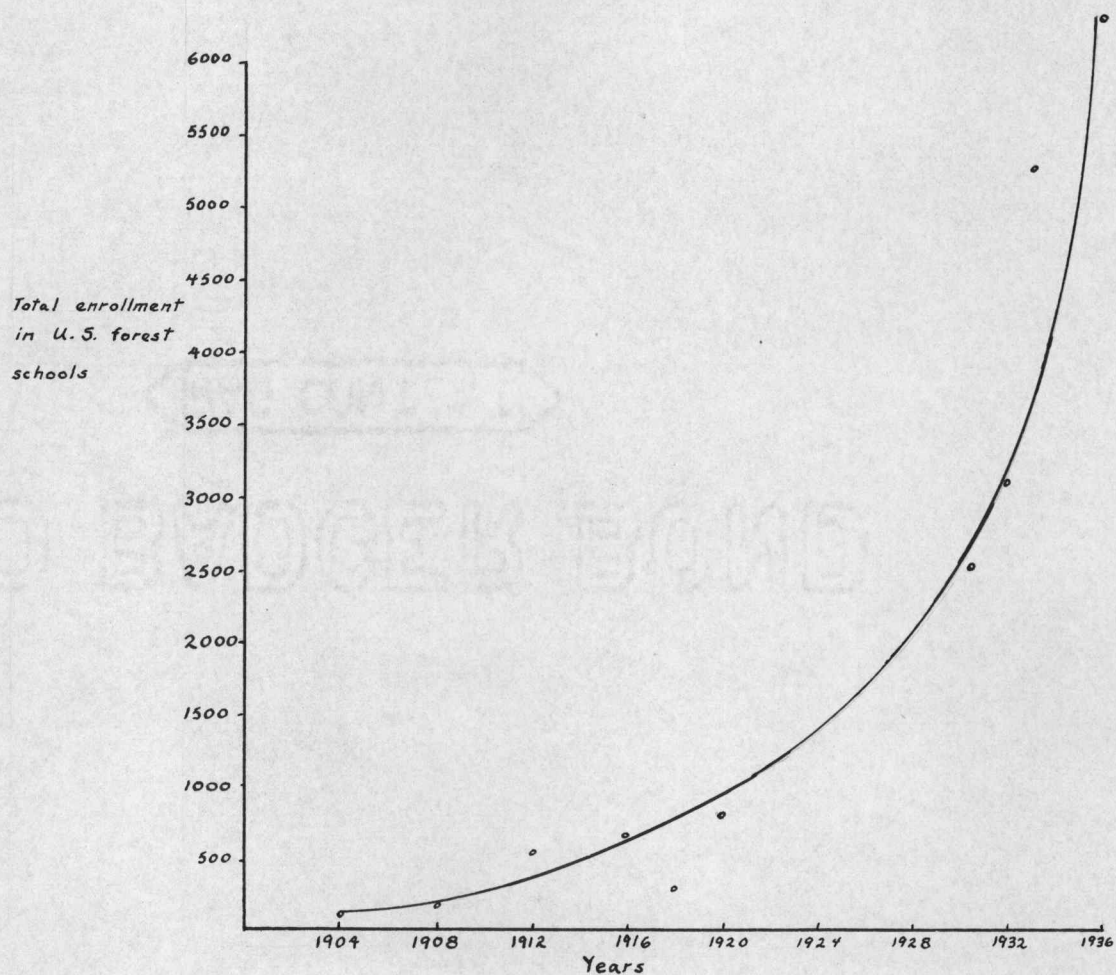
Such rigorous methods are justifiable through force of necessity in these schools; and, although they deny many students the right to the education of their own choosing, yet they permit the schools to operate with few enough students so that good standards are maintained under present facilities. With the innovation of greatly increased enrollments many schools quickly expanded so as to accommodate all those who wished to study forestry on their campus. Schools accustomed to working with fifty or seventy-five forestry students found their enrollment jumping to two hundred or three hundred in a single year. In many cases the result was that the student-professor ratio was increased and field work was hampered through lack of equipment.

These schools, which have undertaken to train all those students wishing to enter the field of forestry, have in many cases managed to maintain former high standards through a careful selection of additional instructors and an increase in enrollment is plainly evident, in some instances largely because the schools have been conscientious in striving to keep up former standards.

That there has been a marked increase in enrollment is plainly evident, when one considers the present size of individual forestry schools of the country as well as the



# Undergraduate Enrollment



number of graduates emerging from these schools annually. Even as early as the spring of 1934, Fritz writing in the Journal of Forestry stated that "in the next ten years 4000 professional foresters will graduate from American schools", and later developments have proven his estimates to be conservative. (23), (1)

#### Graduate students:

It is quite generally conceded by most educators in the field of forestry that four years is insufficient time to fully prepare the professional forester and that five years would be more desirable. (1), (25) As may be seen from the foregoing discussion, many problems have been raised of late through welled enrollments. However, nothing has as yet been done about the establishment of a five-year compulsory curriculum in forestry in an attempt to improve the quality of graduating forestry students. Professor R.S. Hosmer of Cornell University seems to arrive at the crux of the whole matter in the following statement made last December: "with an additional year for professional training not only should it be possible to include the technical subjects that a forester needs if he is to be a real leader, but also it should permit as well that there be included in the curriculum at least an acquaintance with some of the cultural subjects to which today only a few of our forestry graduates have even been introduced." (1)

None of the undergraduate forest schools, not even the older eastern schools, have a mandatory five-year course; but several schools, notably California, Idaho, Michigan and Duke encourage their students to complete five years of training before leaving school. They argue that in a four-

year course a student not only receives a narrow training delinquent in general training apart from forestry, but that even his forestry education is lacking. The average student in forestry has his course subjects pretty much outlined in advance for him during much of the four years he is in school. The character of the courses he takes places them in one of four possible catagories:

1. Technical forestry courses.
2. Basic courses apart from forestry.
3. Recommended elective courses closely associated with forestry.
4. Electives satisfying the student's own hobbies or desires. (25)

Under present conditions insufficient training in courses found under catagories two and four has been provided. Many students find that this is so in their case, and have gone on to take an additional year of work, not merely to be the owner of a Master's degree, which is after all incidental, but to round out their education to their own satisfaction. Connecticut State College does not leave this choice up to the student, but insists that "the undergraduate school is for a broad educational foundation" and that it is the duty of "the student to specialize in his particular field at institutions offering graduate work." (26) Possibly the school is allowing the facilities it has at hand to dictate its policies, but at any rate such a system would tend to produce more broadly-educated foresters.



It has been noted that there is some correlation between the current employment possibilities and the number of graduate students enrolled throughout the country. For example, during the past three years, the number of graduate students in forestry dropped off appreciably from figures of previous years, largely because graduates have had little trouble in securing jobs. However, it is probable that soon there will be a distinct rise in graduate enrollment as a result not only of greatly increased numbers of graduates with the exhaustion of available jobs that must accompany such a condition, but also as a result of the betterment of graduate schools in institutions formerly not concerned with such departments. Ordinarily about 5% of all forest school graduates return for fifth year training.

As time passes the man with a B.S. degree will realize that this amount of education does not suffice if he is to compete successfully with other graduates, and he will return for an additional year of training. Such trends in advanced education will benefit the individual as well as the country and the forestry profession itself.

Professor Spaulding, writing in the Journal of Forestry, briefly summarizes the matter in the following sentences:

"Because of the increasing complexity of forestry practice and the broadening of its scope, it is evident that we must adjust our instruction and its content to meet the forestry of tomorrow as we see it. The problem of industrial forestry and the practice of public forestry demands a wider base than our present curricula indicate."(1)

He further goes on to say that at the present fully seventy per cent of his own students voluntarily or involun-

tarily take five years to complete their education and indicates that "if the student can be shown that he will be better prepared at the end of five years than he would at the end of four years he will willingly devote five years to the process." (1)

#### Sizes of graduating classes:

As has been mentioned previously the number of graduates emerging each year have a direct influence upon the numbers continuing with advanced work. With the many changes that have come to pass in the field of forestry education during the last few years, it might be interesting to analyze the trends in forestry graduating classes briefly. The size of the various graduating classes in forestry remained fairly constant and uniformly low until the years of 1936 and 1937. Reflecting clearly the effects of Roosevelt's encouraging policies, the schools of the country, without exception, showed large increases in the number of graduates, particularly for 1937.

It was not until the CCC movement had been in operation for a little more than a year that freshmen students began to pour into the forestry schools of the country in such large numbers. They had watched those fortunate enough to possess a degree in forestry accept lucrative jobs in the fall of 1933 and the spring of 1934. The fall of 1934 found them eager to cast their lot with those who had so successfully gone before them. At the same time numerous students transferred from other schools as sophomores and juniors. It was largely these transfers that served to swell the graduating class of 1937 to such large proportions. The group graduating in the

spring of 1938--those who remain of the eager throng of freshmen who started in the fall of 1934--will be the largest group of forestry graduates to date.

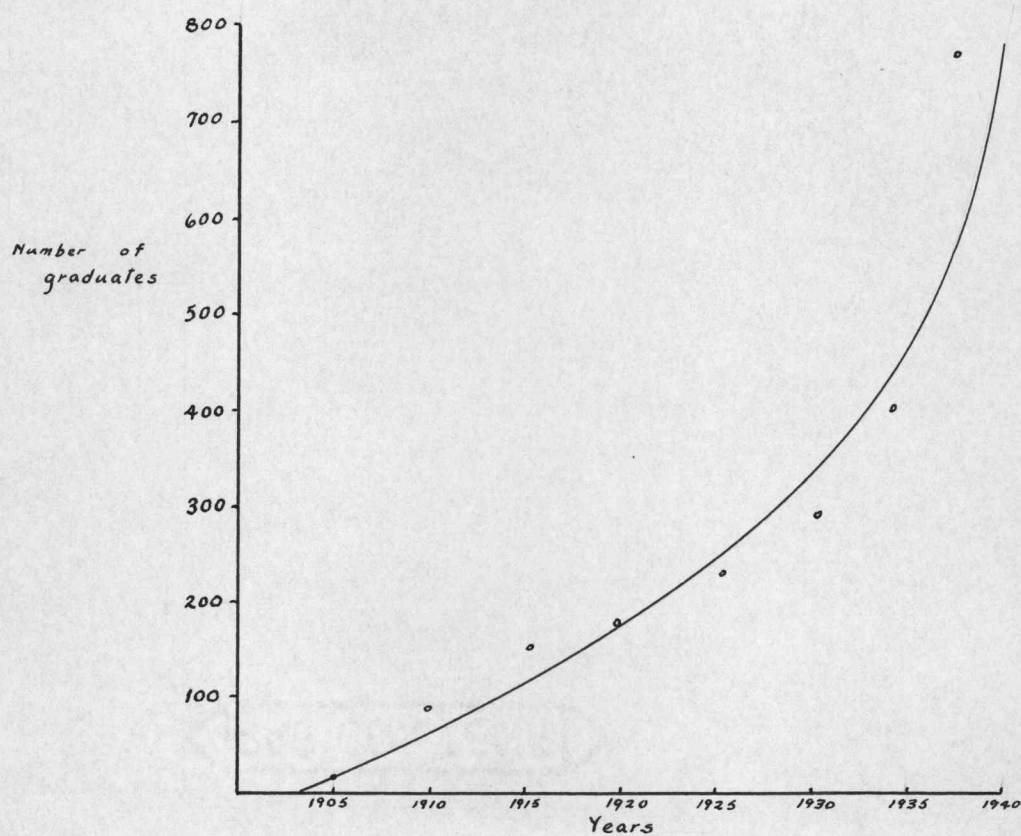
To see just how great have been the increases in graduating classes it might be interesting to choose a few schools at random and examine the sizes of their present senior classes as compared with those during the past nine years. In the case of the University of Idaho, graduating classes 1928-35 inclusive averaged nine students each year. In 1936 this figure moved up to fourteen, and in 1937 it zoomed to thirty-four, an increase of 143% over the largest of all previous classes.(27) Or consider the trends at the University of Michigan, a somewhat larger school than Idaho. The average class from 1928-35 inclusive contained approximately 19 students per year; in 1936 the class increased to thirty-six and in 1937 the record number of fifty-eight students were graduated. This was an increase of sixty-one percent over the next biggest class in the history of the school.(3)

Such data is typical of the conditions existing in the other schools. Larger schools graduated even more students than did Michigan last spring. Leading the country was Syracuse University with the unchallenged total of 93 graduates. And so it is simple to see that professionally trained foresters are rapidly on the increase; unfortunately, the question of what is to be done with them all is not so clear.

Thus, it is obvious that all classes and sizes of forestry schools have experienced rises in enrollment. Studying



# *Sizes of Graduating Classes*



the problem from a national viewpoint tends further to substantiate the evidence presented above. Professor Cedric Guise of Cornell University, who conducts an annual survey of forestry schools in the country, shows the "for the five year period 1929-30 to 1933-34, the undergraduate degrees numbered 344" as an annual average.(1) In 1936 the total number increased to 502, advanced to 777 for 1937 and Guise looks "for between 880 and 1000 undergraduate degrees for each of the years 1938 and 1939."(7)

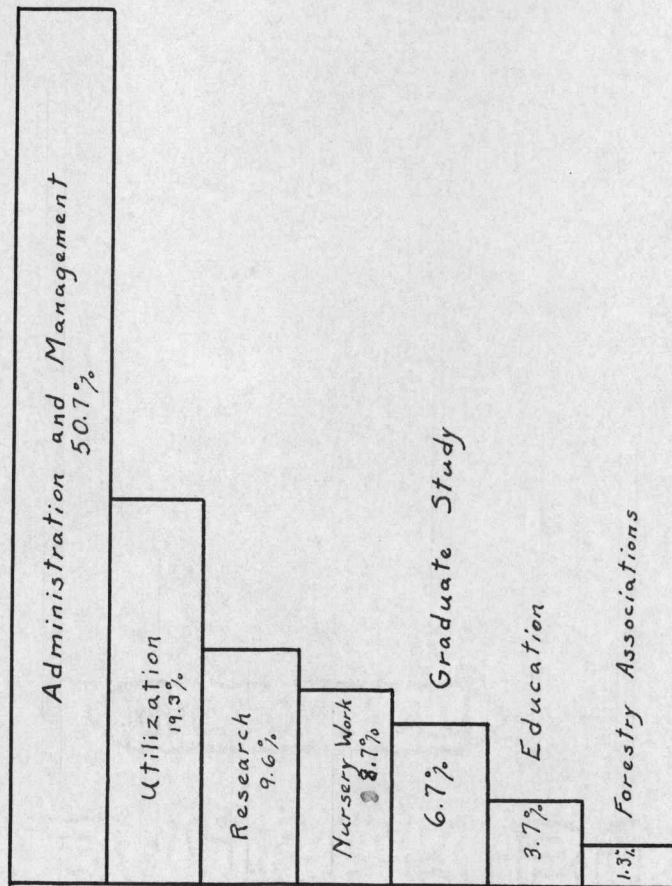
In all probability these enrollment figures will begin to taper off gradually and it is believed that within five years, or possibly a little longer, the number of undergraduates will stabilize at a considerably lower than it is now.(11)

#### Graduate employment:

While attending school the thinking student often considers the future and might well wonder whether all his education expenses have been well invested. The \$2000 or \$3000, or whatever amount he may have needed to finance his education, represent a tangible and costly investment; and he is, of course, interested in what the future has in store for him.

If one could always judge the future by the past, the job outlook for graduates of today would be encouraging. Individual schools report that as many as 85% of their cumulative list of graduates have found employment in forestry work or in work closely associated thereto. 65.2% of the total number of Yale graduates are so employed, and this figure would be slightly higher were it not for the fact that non-

# Forestry Graduate Employment in Per Cent\*



\* Data from Illick "Outline of General Forestry"



graduates are included in the total.(28) Some schools have been more fortunate than others in placing their graduates, but in nearly all cases the percentage in forestry work is high. Fritz states that only "33% of the graduates from 1900 to 1929 drifted from the field of forest employment," and goes on to say that during the past few years this percentage has decreased.(23) Guise points out that according to "statistics gathered in 1929, 67% of forest school graduates were in occupations for which their forestry training had logically prepared them."(1)

In checking over graduate employment it is interesting to note that there is little difference between the percentage of western forest school graduates employed in forestry work as compared with percentages for eastern schools. Apparently the need for professionally-trained foresters has been sufficient in each region to absorb the majority of those seeking employment. Recent government policies pertaining to forestry have helped conditions greatly, but it is certain that such aid cannot exist forever. It is feared that the future will force a greater number of forestry graduates to turn to other fields of employment.(23),(1)

#### CONCLUSIONS:

##### Future employment outlook:

The question, then, that is uppermost in the minds of those students now in school, and especially those who will soon be graduating, pertains to what the future has in store for them in the way of employment. Much discussion centers

around the fact that the Forest Service does not find the need for new men as great as it has been during the past three or four years. Competition in federal service has become much more keen; more than one thousand men took the Junior Forester examination last spring, and of this number, as mentioned before, only three hundred passed.(23)

The whole question boils down to the fact that the federal government in all probability will in the future merely "skim the cream" from the large number of hopefuls graduating each spring. It will be necessary for the student to pass the civil service examination with an exceedingly high grade in order to receive an appointment. Then, too, there is always the possibility, and it has happened before, that the federal government will temporarily cease to give the Junior Forester examination.

With such facts confronting them, graduates of today find it hard to prognosticate what lies ahead. It is possible that federal agencies will soon have a sufficiently large personnel to carry their activities satisfactorily without further additions to their staffs. On the other hand, it is also possible that future expansion in Forest Service personnel and management may equal the rapid growth of recent years. This possibility is not too fantastic, when one compares the intensity with which our forests are managed to that practiced in Europe. Future growth in our country's population, and future demands on forest usage may be such that a more intense system of forest management will result. These changes may come gradually as the years go by, or they may

leap quickly into execution in a few years. At least there is a possibility of the existence of such future conditions to brighten up the future somewhat for the graduate of today interested primarily in federal service.

However, federal work is by no means the only source of employment to the graduate of today. Many states are expanding their forests with the encouragement and support of the federal government. These states need trained men and are beginning to look to the forestry schools to supply them with such men.(11) Few states have developed their forests to a size and degree of management which they believe to be amply large, so that future expansion here will most assuredly provide a fairly large number of positions for forestry graduates.

And last but by no means least is the field of private employ which possesses so many potentialities. Here the surface has only been scratched, as one can easily tell by examining alumni directories of forest schools. Probably about eighty percent of all forestry graduates, who are employed in forestry work or associated work, are employed by the federal government, either in the Forest Service or in some other similar department.(29) The remaining men, who have followed forestry work after graduation, are in either private employ or working for municipal or state governments. It has been said that "there is a potential demand for foresters far beyond the present available supply of competent men", and this statement is certainly true when applied to other than public forestry work.(1)



One has only to consider the size and importance of the private logging industry in the United States in order to realize that here lies a market for hundreds of trained men, if these men can only make it plain to the industry that their knowledge and training is needed.(3) As yet the industry as a whole has not accepted the forestry school graduate as an indispensable unit in its organization. This is probably due to the fact that federal service has offered more highly paid positions and has also been able to absorb most of the professionally-trained foresters. Logging companies, many of them quite small, competing with one another have also been forced to watch salaries and overhead expenses closely.

The presence of virgin stands of timber throughout the west has acted as a dampener on proposals of sustained yield. Rather than risk possible market drops, higher taxes, fire protection and management costs the lumberman has adopted the well-known "cut-and-get-out" policy. However, future conditions are certain to change all this; the country will be compelled to adopt policies similar to those now in effect in certain portions of the Southern Pine and Lake States regions, and this means that a new field will open for men trained in silviculture, management and forest science.

Along with such changes as this will come similar ones in the field of utilization. Men will be needed, and are needed, to take up supervisory positions not only in saw mills but in the multitude of associated lumber industries. Research is constantly bringing to light more and more uses

for wood; these products must not only be manufactured, but they must also be sold, and both operations demand skilled men. At any rate, if the trained graduate is ambitious and conscientious, and if he is willing to accept work with only a modest salary to begin with, past data indicates that he should have better than a sixty per cent chance of finding work in the field of forestry.

#### Future education in forestry schools:

After considering the rapid developments of the past four years, it is difficult to surmise what changes the future will bring in forest education. The big problem that has confronted the different schools in the past few years has been that of excessive enrollment, but it is believed this condition will be relieved somewhat through a gradual rounding off of the number of students brought about by a surplus of graduates in forestry.(1)

Some schools will continue to train all those seeking forestry education of them; this they should be able to do satisfactorily with a decline in enrollment expected for the future. It is, of course, problematical whether all these men will be successful in finding forestry work, but at least they will have received the kind of an education they desired. Other schools, such as Syracuse and Montana, will limit their enrollment to a chosen few. Such a policy is condoned by the Society of American Foresters, and probably will be adopted by more schools in the future.(7)

In considering forestry education of the future, men-

tion should be made of the possibility of changes in the number of forestry schools. It is reasonably certain that additions will be made to the roster of forestry schools; and, if the schools are well-equipped and capable of producing good work, such additions are perfectly acceptable. Actually a heavy obligation rests upon the states who install such training into their school systems; forestry is developing into a profession of distinction and repute, and for this reason the proposed school should be of high caliber or the matter dropped. In some instances "it might be wiser and cheaper to grant scholarships to selected students of ability and send them to an existing school in another state, which is better equipped than any that the first state could afford to create." (1)

Along with changes in the actual number of forestry schools, one might consider the future of those schools already established a little more carefully. Although classrooms have been crowded and equipment limited, forestry schools have been benefitted by heavy enrollments in that increased financial support has been extended them. As has been mentioned before, faculty numbers have been increased, equipment supplemented, new programs instituted and operating expenses in general have been increased. If present budgets can be maintained in the future, even despite the expected decrease in enrollment, the standards of most schools will be raised considerably. (1) Schools should make every effort to see that present funds are not reduced.



In the years to come it is certain that Utilization and Wood Products departments of forestry schools will be more heavily attended than heretofore.(11) It is a definite policy to train men for the "lumber and related industries in such schools as Washington, Michigan and Syracuse", and they have had good success in placing their graduates. Fritz states that "forest schools should train some students for private forest industries as deliberately and adequately as they now train them for the public employ."(23)

Although possibly the graduate trained in forestry has as yet experienced difficulty in obtaining satisfactory employment in private fields, it is reasonably certain that within a short time this will no longer be the case. Even now the larger and more progressive wood industries are turning toward trained men to aid them in their business. All graduates of the University of Michigan last year who were enrolled in the Wood Utilization department had employment opportunities extended them in their field of training.(30)

Much is said of the present excess of professionally-trained foresters, and people wonder just what is to become of them all. It is true that the field will be crowded, but is this not the case in almost any technical field of employment? There are just as many jobless engineers in the country as foresters, and there are a great many more engineers than foresters being trained school today. The same holds for almost any profession being taught in schools today. The whole question simmers down to the fact that, if

the graduate excels in his work, is honest, ambitious and reliable, he will have little trouble in obtaining a reasonably good job within a few years after graduation. For the graduate who has sluffed through school, doing his work in such a way as merely to "get by", the future might be more questionable.

## Sample Questionnaire Sheet

Library facilities: \_\_\_\_\_  
\_\_\_\_\_

No. undergraduates enrolled: \_\_\_\_\_

No. graduate students enrolled: \_\_\_\_\_

No. graduates 1937: \_\_\_\_\_

No. graduates 1936: \_\_\_\_\_

No. graduates 1935: \_\_\_\_\_

No. graduates 1934: \_\_\_\_\_

No. graduates 1933: \_\_\_\_\_

No. graduates 1932: \_\_\_\_\_

No. graduates 1931: \_\_\_\_\_

No. graduates 1930: \_\_\_\_\_

No. graduates 1929: \_\_\_\_\_

No. graduates 1928: \_\_\_\_\_

No. taking JF examination in 1936: \_\_\_\_\_

No. who passed the JF examination 1936: \_\_\_\_\_

Entrance requirements: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

No. students per instructor: \_\_\_\_\_

Approximate average age of faculty: \_\_\_\_\_

% of faculty graduates of your institution: \_\_\_\_\_

Size and character of experimental forest areas: \_\_\_\_\_  
\_\_\_\_\_

Summary of student expenses: \_\_\_\_\_  
\_\_\_\_\_

% of graduates engaged forestry work or work closely associated thereto: \_\_\_\_\_



APPENDIX

The greater part of the following data was obtained through a questionnaire sent all of the forestry schools in the United States in the fall of 1937.

I. Professional forest schools in the United States:

A. Graduate forest schools:

Harvard University(1904); Petersham, Mass.

Yale University(1900); New Haven, Conn.

B. Undergraduate forest schools:

California, University of, (1914); Berkeley, Calif.

Colorado State Ag. Coll.(1911); Fort Collins, Colo.

Connecticut State Ag. Coll.(1923); Storrs, Conn.

Duke University(1932); Durham, North Carolina

Florida, University of,(1937); Gainesville, Fla.

Georgia State College(1906); Athens, Georgia

Idaho, University of,(1909); Moscow, Idaho

Iowa State College of Ag.(1912); Ames, Iowa

Louisiana State University(1925); University, La.

Maine, University of,(1903); Orono, Maine

Michigan State College(1903); East Lansing, Mich.

Michigan, University of,(1903); Ann Arbor, Mich.

Minnesota, University of,(1900); St. Paul, Minn.

Montana, University of,(1914); Missoula, Montana

New Hampshire, University of,(1911); Durham, N.H.

North Carolina State College(1929); Raleigh, N.C.

Oregon State College(1910); Corvallis, Oregon

Pennsylvania State College(1903-1906); Penn. State, Pa.

B. Undergraduate forest schools:(cont.)

Purdue University(1926); Lafayette, Indiana

Syracuse University(1911); Syracuse, New York

Utah State Agricultural College(1927); Logan, Utah

Washington, University of,(1907); Seattle, Wash.

West Virginia University(1935); Morgantown, W.V.

II. Library facilities:

Harvard University--30,000 volumes housed at the arboretum. Complete in all respects.

Yale University--45,000 volumes on forestry supplemented by over 200 technical periodicals and trade journals.

Univ. of Calif.--"Forestry library one of the best of its kind"(20)

Colorado State College--Two libraries: one owned by the Rocky Mt. Forest and Range Experiment Station and one housed in the College Library. Both are accessible to the students.

Connecticut College--4300 volumes on Game Management and additional 8000 volumes on forestry.

Duke University--"Growing collection of books on forestry and related subjects in English, French and German language"(8)

Univ. of Florida--Small at present but being improved.

Georgia State--No information.

Univ. of Idaho--Ample supply of forestry material.

Iowa State College--General college library contains 250,000 selected volumes; receives 5,000 periodicals.

Louisiana University--Maintains a forestry library in the Forestry building including bulletins, books, periodicals, magazines, journals, etc.

University of Maine--1800 books contained in the library; 14 periodicals are received.

Michigan State--All publications and books are kept in the main library of the College.

University of Michigan--Has a very complete forestry library; general library contains 900,671 volumes; 100 periodicals are received.

University of Minnesota--No information.

University of Montana--General library houses 120,000 volumes and receives 600 periodicals.

Univ. of New Hampshire--General library contains 88,000 volumes and receives 100 current publications. A fire last year destroyed the forestry library and "not over 300 books and bulletins on forestry remain."

North Carolina--No information.

Oregon State College--Has approximately 5000 volumes; 2700 periodicals housed in the Forestry Building.

Pennsylvania State College--No information.

Purdue University--259 volumes strictly on forestry and 1856 on allied subjects ; 4000 pamphlets and bulletins on forestry alone with 5000 on allied subjects.

Syracuse University--New library building with <sup>2</sup> a full-time librarians and complete stock of forestry publications.

Utah Agricultural College--No information.

University of Washington--No information.

West Virginia University--500 volumes strictly forestry.



### III. Experimental forest areas:

Harvard University--1/ Arnold Arboretum comprises the most widely known and complete arboretum in the United States. 2/ The Harvard Forest located at Petersham Village was given to the University in 1907. The total area of the Forest is 2458 acres and was first placed under management in 1908. "Starting as a somewhat abused and wholly uncared-for area, the Forest has made substantial progress toward the ideal of a sustained and maximum yield. The production of high-grade timber has been the goal of silvicultural practice at Petersham and until the past few years has shown a profit on its operations." The Forest contains in the neighborhood of 12,000,000 bd. ft. volume; and, since the area was placed under management nearly 7,000,000 bd. ft. of timber have been removed and sold. Students registered for the MF graduate course spend their entire term of residence at Petersham. Provision is made for each student to obtain experience in the various silvicultural operations currently carried on in the Forest, such as planting, weeding, marking for improvement cuttings and thinnings. When funds are available the students are paid for their labors after gaining sufficient experience meets their scholastic requirements. The success of the management of Harvard Forest has been due largely to the efforts of Richard T. Fisher who served as director of the Forest from the time it was first established until 1908 until his death in 1934.

Yale University--1/ Yale Forest contains 7500 well-stocked acres and more than 20,000,000 bd. ft. "All activities appropriate to a tract of this size and character are carried on, affording facilities for field instruction and practice, for experimentation and for the demonstration of applied forestry." 2/ Keene Forest contains 1500 acres of excellent white pine and is located in New Hampshire. The forest is under intensive management. 3/ Bowen Forest in Vermont contains 500 acres of conifer plantations. 4/ The Natural Preserve is located on the edge of New Haven, contains 200 acres and is used for intensive scientific studies in forestry, botany and zoology. Students also use several private forest areas: 1/ The Eli Whitney Forest contains 22,000 acres immediately adjacent to New Haven and is owned by the New Haven Water Company. "The forest has been handled under the direction of the School of Forestry for 30 years and constitutes one of the oldest forests under continuous management in the country." 2/ The Hardtner Forest in Louisiana is composed of 80,000 acres of southern pines and the senior class spends two months here annually. 3/ The senior class also summers on the land of the Crossett Lumber Co. in Arkansas(400,000 acres).

University of California--Blodgett Forest located several miles from the campus contains 2600 acres of second growth pine.

Colorado College--School forest contains 6000 acres of Ponderosa pine and Douglas fir.

Connecticut Agricultural College--School forest contains 700 acres of hardwoods and conifers.

Duke University--The Duke Forest is representative of the various types of timber growth found through the region. Over 100 different species of trees are found within or near the Forest; the total area of the Forest proper, exclusive of the University campus, was 4,696 acres in 1931. It is admirably located for research in forest soils of the Piedmont region because of the diverse soil conditions that obtain within the area. Much of the area is being planted, and the work of putting the Forest under intensive management is well under way. 30300 acres of the Forest adjacent to the campus have been set aside for Arboretum purposes.

University of Florida--1,559 acres of managed forest land are contained in the Austin Cary Memorial Demonstration Forest.

University of Georgia--265 acres of land contained in the Demonstration Forest on the Athens campus. The School Forest located 25 miles from Athens contains 600 acres, A Forestry Nursery with a yearly output of 1 million trees is also located on the campus.

University of Idaho--School Forest contains 7000 acres of chiefly cut-over land. A 4,126 acre tract 15 miles from the campus is used as an experimental and demonstration forest. A 27 acre forest nursery is also maintained.

Iowa State College--School Forest contains 3500 acres of



lightly stocked forest land containing ash, basswood and sycamore located  $\frac{1}{4}$  mile from the campus.

Louisiana State University--School Forest contains 1,000 acres typical of the region; the school has also the permission to use 100,000 acres of privately-owned land.

University of Maine--School Forest contains 17,000 acres of all-aged softwoods and 18 acres of mature white pine.

Michigan State College--Maintains 1157 acres in four areas as experimental forestry plots; experimental cutting in spruce and balsam pulpwood types have been made since 1928, and several plantation areas have established.

University of Michigan--The Saginaw Forest is located two miles from Ann Arbor, is 80 acres in size and contains over fifty forest plantations. The Eber White Woods are comprised of 43 acres of native hardwoods and are managed on a selection system. Stinchfield Forest contains 320 acres half of which are covered with standing timber. Research and planting activities are practiced here.

Ringwood Forest contains 160 acres in the Saginaw Valley which are planted with several experimental plots. A two acre nursery is also operated by the school.

University of Minnesota--No information.

University of Montana--School Forest contains 2000 acres of fir, larch, and yellow pine, varying in size from reproduction to over-maturity.

University of New Hampshire--Control 50 acres of old growth Pine and Hemlock  $\frac{1}{4}$  mile from the classroom; 450 acres of

second growth pine and hardwoods within  $1\frac{1}{4}$  miles from the classroom; 400 acres spruce and northern hardwoods at summer camp in center of White Mtn. National Forest 90 miles from Durham.

North Carolina State College--No information.

Oregon State College--McDonald Forest containing about 5000 acres of typical forest land is conveniently located only seven miles from the campus so that laboratory work can be carried on here. A large Clarke-McNary nursery and Arboretum are located adjacent to the Forest. In addition to the above area the school also owns 3000 acres of forest lands in two blocks removed from the campus. 75,000 acres of forested state lands lying 75 miles from the school have been placed at the disposal of the School of Forestry.

Pennsylvania State College--School forest land and state land under school management total 70,000 acres. A large forest nursery with an annual output of 4,000,000 seedlings is also located on the campus.

Purdue University--School forest contains 200 acres of hardwoods.

Syracuse University--No information.

Utah State Agricultural College--All facilities of the Cache National Forest two miles from the campus are at the disposal of the school.

University of Washington--The Campus Forest contains 582 acres and is located near the campus. Field instructions are given at the Demonstration Forest at LaGrande, Wash-

ington. The Forest contains 2000 acres.

West Virginia University--The School Forest contains 40 acres of farm forest managed as a demonstration of good farm-woods practices. Experiments in forest management and silviculture are conducted on 20,000 acres of privately owned land and "13,000 acres of state forests 30 minutes ride from the college" are available for research purposes.

#### IV. Summer training camps:

Harvard University--Students are required to spend the spring and autumn terms in the field and the mid-winter term at Cambridge.

Yale University--"the summer session is conducted on the Yale Forest in Tolland and Windham Counties, Connecticut. The camp is attractively located near one of the numerous ponds on the forest and has comfortable barracks, mess-rooms and facilities for class work."

University of California--12 weeks are spent in the summer following the Junior year near Quincy, California. Field studies include surveying, timber estimating, mapping, scaling, silviculture and mensuration.

Colorado State Agriculture College--"9 weeks are required as a prerequisite to all forestry courses on the campus." The site is located fifty miles west of Fort Collins in permanent buildings valued at \$5200.

Connecticut Agricultural College--4 weeks are spent on a field trip taken each year either into the southern hardwood and pine region or into the northern spruce region to study silvicultural and utilization problems.



Duke University--Has no summer camp.

University of Florida--Following the sophomore year 10 weeks are spent in summer camps located in northern Georgia. Spring quarter of the senior year (12 weeks) is devoted entirely to field work, likewise.

University of Georgia--10 weeks of field work following the sophomore year are required of all graduates.

University of Idaho--No summer is provided.

Iowa State College--12 weeks of field work are required of each student following the freshmen year. Camps are located in different regions each year.

Louisiana State University--a 10 week summer camp is required of each student prior to his senior year. Seniors also spend 6 more weeks in camp on some active forestry operation.

University of Maine--Men are required to attend a six weeks summer camp at the end of the sophomore year on a leased location on the White Mountain National Forest. The seniors also spend eight weeks from the middle of November to the middle of January in permanent camps owned by the University situated on a 17,000 acre tract owned by the state.

Michigan State College--No summer is provided.?

*10 week camp*

University of Michigan--A 10 week summer camp is required after the sophomore year. A course fee \$50 is charged.

University of Minnesota--Students majoring in General Forestry spend the spring quarter of the Junior year in the field on the Cloquet Forest Experiment Station.

University of Montana--Plans are being formulated to inaugurate an annual summer camp, the first of which will be held in 1939.

University of New Hampshire--8 weeks are spent in a summer camp at Swift River Camp, on the White Mountain National Forest. Many visitors from the Forest Service in Washington attend the camp.

North Carolina State College--Summer camp is scheduled for the summer following the sophomore year.

Oregon State College--No summer camp is required.

Pennsylvania State College--No information available.

Purdue University--Summer camp provided on 5600 acres of State forest land stocked with hardwoods; camp equipped with piped water, sewage disposal, electricity and comfortable living quarters.

Syracuse University--<sup>10</sup>~~8~~ weeks are spent during the summer following the sophomore year on Cranberry Lake in practical woods work.

Utah State Agricultural College--No information available.

University of Washington--Spring quarter of the sophomore year is spent on the Pack Demonstration Forest at LaGrande.

West Virginia University--At the close of the sophomore year, forestry students spend a period of ten weeks in camp on National Forest lands in the Appalachian Mountains.

V. Student expenses (total annual student expense for one year).

Harvard University-----\$1100-1200

Yale University-----\$900

University of California-----	\$500-650
Colorado College-----	\$400-600
Connecticut State College-----	\$650
Duke University-----	\$608
University of Florida-----	\$344-445
University of Georgia-----	\$926
University of Idaho-----	\$310-600
Iowa State College-----	\$600
Louisiana State University-----	\$450
University of Maine-----	\$600-700
Michigan State College-----	\$450
University of Michigan-----	\$550-600
University of Minnesota-----	No information
University of Montana-----	\$379-499
University of New Hampshire-----	\$430-640
North Carolina State College-----	\$600
Oregon State College-----	\$400-600
Pennsylvania State College-----	\$600
Purdue University-----	\$450-500
Syracuse University-----	No information
Utah State Agricultural College-----	\$500
University of Washington-----	\$450-600
West Virginia University-----	\$500

#### VI. Entrance requirements:

Harvard University--"Graduates of scientific schools, colleges, and universities of high standing are admitted to the School of Forestry provided that they have done



Yale University--"Graduates of scientific schools and colleges in good standing" are admitted. One full year in botany, at least one course in zoology, physics, inorganic chemistry, geology and economics as well as mathematics through trigonometry are required. It is possible, however, to enter the school as a special student.

University of California--"Unusually high scholarship standards for admission to forestry courses which begin the junior year are required."

Colorado College--15 units are required, 10 of which must be from English, foreign language, history and social science, mathematics and science.

Connecticut Agricultural College--"Require 15 high school units; student must be in upper  $\frac{1}{4}$  of his class."

University of Florida--Graduates of accredited high schools or equivalent thereof.

Duke University--"Students who have received a Bachelor's degree for a four-year undergraduate course from a college of sufficiently high standing may be admitted to take courses in the Graduate School of Arts and Sciences." Students from "acceptable" high schools are admitted to the undergraduate school.

University of Georgia--Person must be 16 years of age, must have 15 units of high school training including 3 of English, 2 special studies, 2 mathematics and 1 science; entrance based on certificate or entrance examination.

University of Idaho--Students must be graduates of accredited high schools.

Iowa State College of Agriculture--Person must be a graduate of an acceptable high school; sophomore class held to a 75 maximum.

Louisiana State University--"graduation from an affirmed high school and completion of 1 year of University work with at least a C average."

University of Maine--Require 15 high school units including English 3, Plane Geometry 1, History 1, Algebra 1, Science 1, Electives 8

Michigan State College--Graduates of acceptable high schools with training in certain specified subjects are taken.

University of Michigan--"Candidates for admission to the School of Forestry and Conservation as regular students must have not less than two years of credit collegiate grade in an approved institution with at least as many points as hours. Specific subjects required for admission vary according to the branch of forestry in which the student is interested."

University of Minnesota--Require that the entering student be a graduate of an accredited high school.

University of Montana--"Applicants must be at least 16 years of age and must present evidence of good moral character. They must present 15 units of high school work including 3 of English, 1 American History, 2 Mathematics,

2 History and Social Science and 2 laboratory science."

University of New Hampshire--Student must be graduate of acceptable high school and must have completed work in specified courses.

North Carolina State College--Student must be a graduate of an acceptable high school who has completed work in courses demanded by college authorities.

Oregon State College--Student must be of good moral character and present certificates indicating that he has completed work which will render him capable of taking college work.

Pennsylvania State College--Require that person be a graduate of a high school of acceptable standards.

Purdue University--Must be graduate of an accredited high school or equivalent thereof.

Syracuse University--"Number of students entering freshmen class and number of students admitted to advanced standing are limited to a quota established by the Board of Trustees." Certain subjects are required of entering freshmen and they must also earn a quota of points each semester or be dropped from school.

Utah State Agricultural College--Must be graduates of accredited high schools or equivalent thereof.

University of Washington--"Only recommended students of fully accredited four year secondary schools are admitted on certificate; entrants must have high school grades one unit above passing; advanced algebra, geometry and for-



oreign language are among the required subjects."

West Virginia University--"Any man who has graduated from a standard West Virginia four-year high school, or its equivalent, is eligible for entrance."

#### VII. Junior Forester Examination:

Results on the query relative to students taking the Junior Forester examination were decidedly meager. Although the data is consequently limited, that available has been presented below.

##### University of Idaho:

1936--65% passed

1937--100% passed

##### University of Louisiana:

1936--33% passed

##### University of Maine:

1936--30% passed

1937--65% passed

##### Michigan State College:

1937--75% passed; four of the men received grades above 90%.

##### Oregon State College:

1929--92% passed

1930--63% passed

1931--71% passed

1933--85% passed

1935--32% passed

1936--70% passed

1937--93% passed; six men received grades above 90%

VIII. Faculty data(number of students per instructor, approximate age of faculty, percentage of faculty graduates of the institution in which they are teaching).

<u>School</u>	<u># students/instructor</u>	<u>Faculty Ages</u>	<u>% of fac. home train- ed.</u>
Harvard Univ.	--	--	--
Yale University	4	50 yr.	--
Univ. of Calif.	40	45	20%
Colorado College	28	42	20%
Conn. State Ag. Coll.	10	45	20%
Duke University	4	--	0%
University of Florida	15	33	0%
University of Georgia	28	40	60%
University of Idaho	56	32	0%
Iowa State College	44	45	--
Louisiana State Univ.	18	36	17%
University of Maine	27	38	65%
Michigan State Coll.	39	34	20%
University of Michigan	15	40	36%
University of Minnesota	47	45	---
University of Montana	70(approx.)	--	---
University of New Hamp.	32	--	---
North Carolina	--	--	---
Oregon State College	50(approx.)	40	90%
Pennsylvania State	51	--	---
Purdue University	71	37	0%
Syracuse University	10	--	---
Utah State Ag. Coll.	53	--	---

VIII. Faculties(cont.):

<u>School</u>	# students/ instructor	Faculty Age	% of fac. home <u>trained.</u>
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University of Wash.	50	--	---
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West Virginia Univ.	12	38	0%
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## IX. Graduating classes 1928-1937 inclusive:

Harvard University(graduate school only).Yale University(graduate school only).University of California:

1928--8	1933--28
1929--10	1934--30
1930--15	1935--30
1931--18	1936--34
1932--12	1937--62

Colorado State Agricultural College:

1928--9	1933--12
1929--11	1934--16
1930--11	1935--22
1931--14	1936--37
1932--14	1937--40

Connecticut Agricultural College:

1928--6	1933--12
1929--9	1934--9
1930--3	1935--7
1931--5	1936--7
1932--3	1937--12

Duke University(newly established; one graduate)University of Florida(newly established; no graduates)University of Georgia:

1928--4	1933--12
1929--3	1934--29
1930--3	1935--12
1931--14	1936--23
1932--6	1937--33



University of Idaho:

1928--13	1933--12
1929--8	1934--14
1930--10	1935--15
1931--20	1936--23
1932--13	1937--37

Iowa State College:

1928--17	1933--16
1929--13	1934--17
1930--17	1935--22
1931--23	1936--26
1932--11	1937--32

Louisiana State University:

1928--3	1933--2
1929--3	1934--5
1930--5	1935--5
1931--9	1936--3
1932--10	1937--21

University of Maine:

1928--20	1933--21
1929--22	1934--16
1930--20	1935--20
1931--19	1936--11
1932--24	1937--24

Michigan State College:

1928--21	1933--17
1929--15	1934--5
1930--17	1935--19
1931--15	1936--19
1932--18	1937--35

University of Michigan:

1928--10	1933--24
1929--16	1934--18
1930--21	1935--27
1931--22	1936--44
1932--31	1937--56

University of Minnesota:

1928--12	1933--5
1929--7	1934--12
1930--10	1935--7
1931--18	1936--10
1932--9	1937--48

University of Montana:

1928--5	1933--9
1929--13	1934--9
1930--12	1935--8
1931--8	1936--11
1932--17	1937--16

University of New Hampshire:

1928--4	1933--5
1929--6	1934--4
1930--5	1935--5
1931--4	1936--5
1932--4	1937--15

North Carolina State College:

1928--0	1933--8
1929--0	1934--11
1930--16	1935--22
1931--14	1936--23
1932--10	1937--30

Oregon State College:

1928--17	1933--24
1929--24	1934--24
1930--22	1935--16
1931--23	1936--18
1932--33	1937--43

Pennsylvania State College:

1928--13	1933--
1929--15	1934--22
1930--27	
1931--	
1932--	

Purdue University:

1928--	1933--7
1929--	1934--9
1930--5	1935--12
1931--10	1936--12
1932--9	1937--17

Syracuse University:

1928--	1933--
1929--	1934--54
1930--	1935--
1931--	1936--
1932--	1937--90

Utah State College:

1928--	1933--6
1929--	1934--5
1930--2	1935--11
1931--5	1936--27
1932--6	1937--54

University of Washington: No information available.

University of West Virginia: Newly established; no graduates as yet.

## X. Forestry School Graduates Engaged in Forestry Work:

Harvard University-----	70%
Yale University-----	65%
University of California-----	90%
Colorado State College-----	86%
Connecticut Agricultural College-----	No information
Duke University-----	Newly established
University of Florida-----	" "
University of Georgia-----	60%
University of Idaho-----	85%
Iowa State College of Agriculture-----	93% inferior
Louisiana State University-----	90%
University of Maine-----	68%
Michigan State College-----	73%
University of Michigan-----	71%
University of Minnesota-----	No information
University of Montana-----	85%
University of New Hampshire-----	80%
North Carolina State College-----	55%
Oregon State College-----	95%



Pennsylvania State College-----	No information
Purdue University-----	75%
Syracuse University-----	80%
Utah State Agricultural College-----	85%
University of Washington-----	85%
West Virginia University-----	Newly established

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